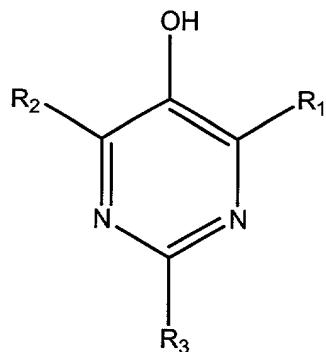


## CLAIMS

What is claimed is:

1. A compound of the following formula, and acid or base addition  
5 salts thereof:



Formula 4

10

wherein,

R<sub>1</sub> is selected from the group consisting of hydrogen, amino, alkylamino, N,N-dialkylamino;

R<sub>2</sub> is selected from the group consisting of hydrogen, alkyl; and

R<sub>3</sub> is an electron-donating substituent.

2. The compound of claim 1, wherein,

R<sub>3</sub> is selected from the group consisting of alkoxy, amino, N-alkylamino, and N,N-dialkylamino.

5

3. The compound of claim 1, wherein,

R<sub>1</sub> is selected from the group consisting of hydrogen, and alkyl;

R<sub>2</sub> is selected from the group consisting of hydrogen, and alkyl;  
and

10 R<sub>3</sub> is selected from the group consisting of alkoxy, amino, N-alkylamino, and N,N-dialkylamino.

4. The compound of claim 1, wherein,

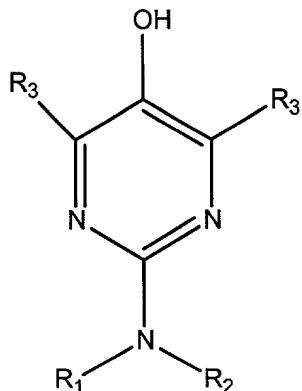
R<sub>1</sub> is selected from the group consisting of amino, N-alkylamino  
15 and N,N-dialkylamino;

R<sub>2</sub> is selected from the group consisting of hydrogen, and alkyl;  
and

R<sub>3</sub> is selected from the group consisting of alkoxy, amino, N-alkylamino, and N,N-dialkylamino.

20

5. The compound of claim 1, selected from the following formula:



Formula 7

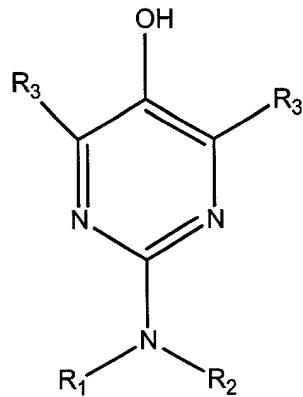
5

wherein,

R<sub>1</sub>, and R<sub>2</sub> are selected from the group consisting of hydrogen, methyl, ethyl, t-butyl, pentyl, octyl, phytyl; and  
R<sub>3</sub> is selected from the group consisting of hydrogen, methyl, t-butyl.

10

6. The compound of claim 1, selected from the following formula:



Formula 7

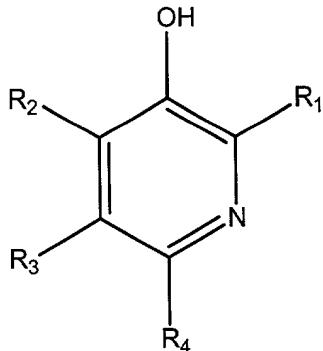
wherein,

R<sub>1</sub> is selected from the group consisting of hydrogen, methyl, ethyl, t-  
5 butyl, pentyl, octyl, phytyl;

R<sub>2</sub> is selected from the group consisting of hydrogen, methyl, ethyl, t-  
butyl, pentyl, octyl, phytyl; and

R<sub>3</sub> is selected from the group consisting of methyl and t-butyl.

10 7. A compound of the following formula, and acid or base addition salts  
thereof:



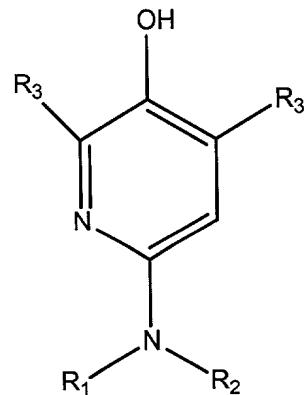
Formula 5

wherein,

5        R<sub>1</sub> is selected from the group consisting of hydrogen, and, alkyl;  
R<sub>2</sub> is selected from the group consisting of hydrogen, and alkyl;  
R<sub>3</sub> is selected from the group consisting of hydrogen, and alkyl; and  
R<sub>4</sub> is an electron-donating substituent.

10      8.      The compound of claim 7, wherein R<sub>4</sub> is selected from the group  
consisting of alkoxy, amino, N-alkylamino, and N,N-dialkylamino.

9.      The compound of claim 7, selected from the following formula:



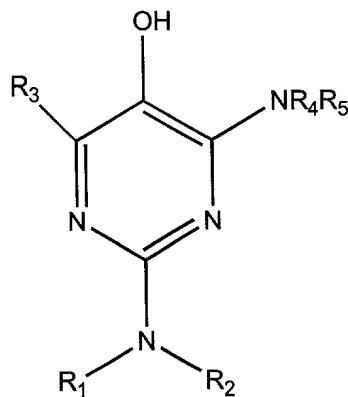
Formula 8

wherein,

R<sub>1</sub>, and R<sub>2</sub> are selected from the group consisting of hydrogen, methyl,  
5      ethyl, t-butyl, pentyl, octyl, phytyl; and  
R<sub>3</sub> is selected from the group consisting of hydrogen, methyl, t-butyl.

10. The compound of claim 7, selected from the following formula:

5



Formula 9

wherein,

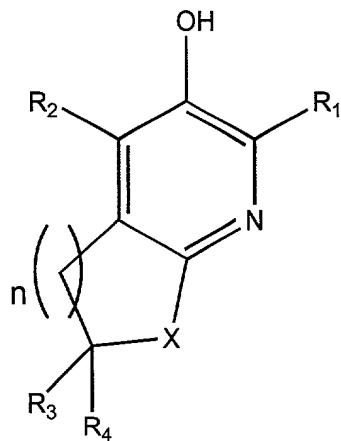
10  $\text{R}_1$  is selected from the group consisting of hydrogen, methyl, ethyl, t-

butyl, pentyl, octyl, phytyl;

$\text{R}_2$  is selected from the group consisting of hydrogen, methyl, ethyl, t-butyl, pentyl, octyl, phytyl; and

R<sub>3</sub>, R<sub>4</sub> and R<sub>5</sub> is selected from the group consisting of hydrogen, methyl and t-butyl.

11. A compound of the following formula, and acid or base addition salts  
5 thereof:



Formula 6

wherein,

10 X is N-R<sub>5</sub> or O;

R<sub>1</sub> is selected from the group consisting of hydrogen, and, alkyl;

R<sub>2</sub> is selected from the group consisting of hydrogen, alkyl;

R<sub>3</sub> is selected from the group consisting of hydrogen, alkyl;

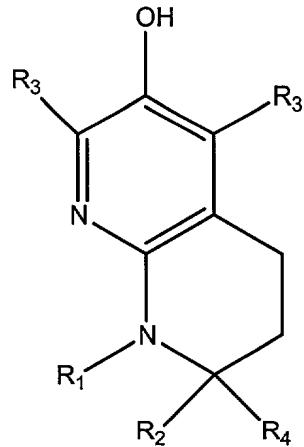
R<sub>4</sub> is selected from the group consisting of hydrogen, alkyl;

$R_5$  is selected from the group consisting of hydrogen, alkyl; and

$n$  is 1 or 2.

12. A compound of claim 11, selected from the following formula:

5



Formula 10

10

5

wherein,

R<sub>1</sub> is selected from the group consisting of hydrogen and methyl;

R<sub>2</sub> is selected from the group consisting of hydrogen, methyl, ethyl, t-butyl, pentyl, octyl, phytyl;

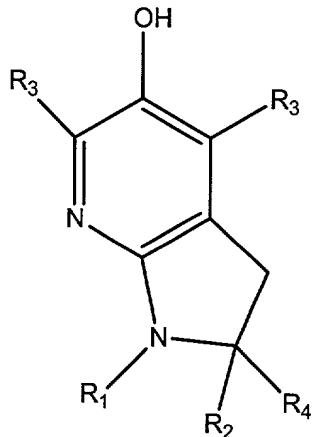
R<sub>3</sub> is selected from the group consisting of hydrogen, methyl and t-butyl;

10 and

R<sub>4</sub> is selected from the group consisting of hydrogen, methyl, ethyl, t-butyl, pentyl, octyl, phytyl.

13. A compound of claim 11, selected from the following formula:

15



Formula 11

wherein,

R<sub>1</sub> is selected from the group consisting of hydrogen and methyl;

5 R<sub>2</sub> is selected from the group consisting of hydrogen, methyl, ethyl, t-

butyl, pentyl, octyl, phytyl;

R<sub>3</sub> is selected from the group consisting of hydrogen, methyl and t-butyl;

and

R<sub>4</sub> is selected from the group consisting of hydrogen, methyl, ethyl, t-

10 butyl, pentyl, octyl, phytyl.

14. A method of inhibiting the oxidation of compounds or mixtures comprising the addition of an effective amount of a compound of claim 1 to said compound or mixture.

5 15. The method of claim 14, wherein the compound or mixture may be any base oil or mixture thereof suitable for the intended use of a lubricant.

16. The method of claim 15, wherein the base oil is selected from the group consisting of a conventionally refined mineral oil, an oil derived from coal tar or shale, a vegetable oil, an animal oil, a hydrocracked oil, or a synthetic oil, or any mixture thereof.

10 17. A method of inhibiting the oxidation of compounds or mixtures comprising the addition of an effective amount of a compound of claim 7 to said compound or mixture.

15 18. The method of claim 17, wherein the compound or mixture may be any base oil or mixture thereof suitable for the intended use of a lubricant.

19. The method of claim 18, wherein the base oil is selected from the group consisting of a conventionally refined mineral oil, an oil derived from coal tar or shale, a vegetable oil, an animal oil, a hydrocracked oil, or a synthetic oil, or any mixture thereof.

5

20. A method of inhibiting the oxidation of compounds or mixtures comprising the addition of an effective amount of a compound of claim 11 to said compound or mixture.

10 21. The method of claim 20, wherein the compound or mixture may be any base oil or mixture thereof suitable for the intended use of a lubricant.

22. The method of claim 21, wherein the base oil is selected from the group consisting of a conventionally refined mineral oil, an oil derived from coal tar or shale, a vegetable oil, an animal oil, a hydrocracked oil, or a synthetic oil, or any mixture thereof.

20 23. A method of reducing the oxidative environment in a petroleum composition selected from the group consisting of lubricating compositions and liquid organic fuels, said method comprising adding to said petroleum

composition an effective amount of an antioxidant composition, said antioxidant composition comprising a compound of claim 1.

24. A method of reducing the oxidative environment in a petroleum  
5 composition selected from the group consisting of lubricating compositions and liquid organic fuels, said method comprising adding to said petroleum composition an effective amount of an antioxidant composition, said antioxidant composition comprising a compound of claim 7.

10 25. A method of reducing the oxidative environment in a petroleum composition selected from the group consisting of lubricating compositions and liquid organic fuels, said method comprising adding to said petroleum composition an effective amount of an antioxidant composition, said antioxidant composition comprising a compound of claim 11.

15

26. A method of inducing antioxidant activity in warm-blooded animals comprising administering to warm-blooded animals an antioxidantingly effective amount of a biologically active composition, the biologically active composition comprising a compound of claim 1.

20

27. A method of inducing antioxidant activity in warm-blooded animals comprising administering to warm-blooded animals an antioxidantingly effective amount of a biologically active composition, the biologically active composition comprising a compound of claim 7.

5

28. A method of inducing antioxidant activity in warm-blooded animals comprising administering to warm-blooded animals an antioxidantingly effective amount of a biologically active composition, the biologically active composition comprising a compound of claim 11.

10

29. A method of treating free radical-mediated cellular damage in warm-blooded animals, comprising administering to warm-blooded animals an antioxidantively effective amount of a compound of claim 1.

15

30. A method of treating free radical-mediated cellular damage in warm-blooded animals, comprising administering to warm-blooded animals an antioxidantively effective amount of a compound of claim 7.

D. Pratt et al.  
Filing Date: June 25, 2001  
Attorney Docket No. N-6636  
Customer No. 23456

31. A method of treating free radical-mediated cellular damage in warm-blooded animals, comprising administering to warm-blooded animals an antioxidantively effective amount of a compound of claim 11.